

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1-23 (canceled in favor of the parent, or continuing applications).

24. (original) A loop reactor apparatus comprising:

a plurality of vertical segments;

a plurality of upper horizontal segments;

a plurality of lower horizontal segments;

wherein each of said vertical segments is connected at an upper end thereof by a smooth upper bend to one of said upper horizontal segments, and is connected at a lower end thereof by a smooth lower bend to one of said lower horizontal segments thus defining a continuous flow path adapted to convey a fluid slurry, said reactor being substantially free from internal obstructions;

means for introducing monomer reactant, polymerization catalyst and diluent into said reactor;

means for continuously moving said slurry along said flow path;

at least one elongated hollow appendage adjacent a downstream end of one of said lower horizontal sections, said appendage being in open communication with said flow path for continuously withdrawing product slurry; and

an elongated flash line in fluid communication with said appendage for transferring product slurry from said appendage to a flash means, said flash line having a heater associated therewith to heat said product slurry.

25. (original) An apparatus according to claim 24 wherein said at least one appendage is attached to one of said lower horizontal segments thus giving an appendage-carrying lower horizontal segment, said appendage being oriented along a vertical centerline plane of said appendage-carrying lower horizontal segment and adjacent to the smooth lower bend attached to the downstream end of said appendage-carrying lower horizontal segment.

26. (original) Apparatus according to claim 24 wherein said appendage is attached at an angle between 0 and 90 degrees.

27. (original) An apparatus according to claim 24 wherein said at least one appendage is attached to said smooth bend attached to said downstream end of said appendage-carrying lower horizontal segment thus giving an appendage-carrying smooth bend.

28. (currently amended) An apparatus in accordance **[in accordance]** with claim 27 wherein said appendage is attached to said appendage-carrying smooth bend at a point at least 1 but less than 45 degrees from a centerline of the adjacent vertical segment.

29. (currently amended) Apparatus according to claim **[31] 27** wherein said appendage is attached at an angle between 0 and 90 degrees.

30. (original) Apparatus according to claim 28 wherein said at least one appendage is attached at a right angle to a tangent to said appendage-carrying bend.

31. (original) Apparatus according to claim 28 wherein said at least one appendage is attached tangentially to said appendage-carrying bend.

32. (original) Apparatus according to claim 31 wherein said at least one appendage is attached at a point spaced away from said vertical center plane an amount within the range of 20-45 degrees.

33. (original) Apparatus according to claim 31 wherein said at least one appendage is exactly one appendage.

34. (original) Apparatus according to claim 31 wherein said at least one appendage is a plurality of appendages.

35. (new) A loop reactor apparatus comprising:
a pipe loop reactor adapted for conducting an olefin polymerization process comprising polymerizing at least one olefin monomer in a liquid diluent to produce a fluid slurry comprising liquid diluent and solid olefin polymer particles; and
at least one elongated hollow appendage in direct fluid communication with said pipe loop reactor adapted for removal of a portion of the fluid slurry from said pipe loop reactor, said appendage having an internal diameter of from 1 inch to less than 8 inches.
36. (new) A loop reactor apparatus according to claim 35, said loop reactor apparatus having at least two hollow appendages.
37. (new) A loop reactor apparatus according to claim 35, wherein said loop reactor apparatus has a capacity of 30,000 gallons or greater.
38. (new) A loop reactor apparatus according to claim 35, said appendage having an internal diameter of from about 2 to about 3 inches.
39. (new) A loop reactor apparatus according to claim 38, wherein said loop reactor apparatus has a capacity of 30,000 gallons or greater.
40. (new) A loop reactor apparatus according to claim 35, said appendage having an internal diameter of about 2 inches.
41. (new) A loop reactor apparatus according to claim 40, wherein said loop reactor apparatus has a capacity of 30,000 gallons or greater.
42. (new) A loop reactor apparatus according to claim 40, wherein said loop reactor apparatus has a capacity greater than 30,000 gallons and three of said elongated hollow appendages.
43. (new) A loop reactor apparatus comprising:

a pipe loop reactor adapted for conducting an olefin polymerization process comprising polymerizing at least one olefin monomer in a liquid diluent to produce a fluid slurry comprising liquid diluent and solid olefin polymer particles; and

an elongated hollow appendage in direct fluid communication with said pipe loop reactor adapted for removal of the fluid slurry from said pipe loop reactor, wherein said appendage has an inner diameter that is from about 4% to about 37% of the inner diameter of the pipe loop reactor.

44. (new) A pipe loop reactor according to claim 43, wherein said appendage has an inner diameter that is from about 9% to about 14% of the nominal inner diameter of the pipe loop reactor.

45. (new) A pipe loop reactor according to claim 43, wherein said appendage has an inner diameter that is about 9% of the inner diameter of the pipe loop reactor.

46. (new) A loop reactor apparatus comprising:
a pipe loop reactor adapted for conducting an olefin polymerization process comprising polymerizing at least one olefin monomer in a liquid diluent to produce a fluid slurry comprising liquid diluent and solid olefin polymer particles; and
at least one elongated hollow appendage in direct fluid communication with said pipe loop reactor said hollow appendage adapted for removal of a portion of the fluid slurry from said pipe loop reactor and for selectively removing the fluid slurry from a stratum where the solid olefin polymer particles are more concentrated.

47. (new) A loop reactor according to claim 46, wherein the pipe loop reactor comprises a segment having a larger diameter than another segment of the pipe loop reactor, and said hollow appendage is attached to said larger diameter segment.

48. (new) A loop reactor according to claim 46, wherein said hollow appendage is disposed on a smooth curve or elbow of said loop reactor apparatus.

49. (new) A loop reactor apparatus comprising:

a pipe loop reactor adapted for conducting an olefin polymerization process comprising polymerizing at least one olefin monomer in a liquid diluent to produce a fluid slurry comprising liquid diluent and solid olefin polymer particles; and

a plurality of elongated hollow appendages in direct fluid communication with said pipe loop reactor adapted for removal of a portion of fluid slurry from said pipe loop reactor, wherein at least two of said hollow appendages are disposed on a smooth curve or elbow of said loop reactor apparatus at different orientations apparatus.

50. (new) A loop reactor apparatus according to claim 48, wherein said at least two hollow appendages are at different attachment orientations.

51. (new) A loop reactor apparatus according to claim 48, wherein said at least two hollow appendages are at different orientations relative to how far said at least two appendages are up said curve of elbow.

52. (new) A loop reactor apparatus according to claim 48, wherein said at least two hollow appendages are at different orientations as to the angle between said appendages and a center plane of said loop reactor apparatus.

53. (new) A loop reactor apparatus having a capacity greater than 30,000 gallons, said loop reactor apparatus comprising:

a pipe loop reactor adapted for conducting an olefin polymerization process comprising polymerizing at least one olefin monomer in a liquid diluent to produce a fluid slurry comprising the liquid diluent and solid olefin polymer particles;

means for introducing the olefin monomer and the diluent into the pipe loop reactor;

means for introducing catalyst into the pipe loop reactor;

means for continuously moving the slurry along the pipe loop reactor; and

means for continuously taking off the fluid slurry from the pipe loop reactor.

54. (new) A loop reactor apparatus according to claim 53, wherein said means for continuously taking off the fluid slurry comprises three elongated hollow appendages in direct fluid communication with said pipe loop reactor.